INTEROFFICE MEMORANDUM

TO: Joint Interoperability Test Command (JITC)
ATTN: Mr. John Gese

FROM: Chief, DSN Division (NS53)

DATE: 18 March 2003

SUBJECT: DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches

References: (a) GSCR, JIEO Technical Report 8249, March 1997
(b) GSCR (DRAFT) March 1, 2003

Preparer: Lyndon Johnson/NS535/703-882-0339

1. Reference (a) establishes the general MLPP requirements for access trunks and call processing to a remote office commonly known as Private Branch Exchange (PBX). This reference is currently under revision and the requirements for the Small End Office and PBX category of switches are being further defined to allow Multi-Level Precedence and Preemption (MLPP) features to be implemented using a smaller version of multi-vendor switching systems.

2. Reference (a) did not include detailed requirements for the PBX category of switches that could be used for interoperability verification, certification and validation IAW CJCSI-6212. The purpose of this memo is to provide interim guidance on the minimum essential requirements for the PBX category of switches pending the publication of the reference (b).

3. Reference (b) expands the category of switches that can be used to provide DSN service and details the minimum essential requirements for each category of switch. Prior to the official publication of reference (b), switches undergoing and completing certification testing prior to 01 October 2003 are required to meet the minimum essential requirements as specified in reference (a) as modified by the enclosed matrix. This guidance is rescinded upon publication of reference (b).

DISA, IM, NS53, DSN Global Network Requirements for Small End Office and Private Branch Exchange Category of Switches, 18 March 2003

4. Comments or concerns with respect to interpretation or clarification of this memo should be directed to Mr. Lyndon L. Johnson, NS535, DSN 381-0339, Commercial 703-882-2881.

Enclosure a/s

HOWARD C. OSMAN
Chief, Defense Switched
Network Division

Requirements Matrix

The following matrix summarizes the requirements for the PBX switch type for each feature/function described in Reference (b). A blank space indicates that this feature/function is not applicable to the PBX category of switches. This matrix should be used in conjunction with Reference (b) and not as a stand-alone document.

(Enclosure)

PARAGRAPH	SUBJECT			
			PBX1	PBX2
	SECTION 2 - Capabilities and Features			
2.1.1	Individual Line		R	R
2.1.3	Denied Originating Service		C	
2.1.4	Code Restriction and Diversion		C	
2.1.5.1	Call Waiting (CW)		C	
2.1.5.2	Cancel Call Waiting		C	
2.1.6	Three-Way Calling (TWC)		C	
2.1.7	Add-On Transfer and Conference Calling Features		C	
2.1.7.1	Call Transfer Individual - All Calls		C	
2.1.7.2	Call Transfer - Internal Only		C	
2.1.7.3	Call Transfer - Individual - Incoming Only/Add-on Consultation Hold - Incoming Only		C	
2.1.7.4	Call Transfer - Outside		C	
2.1.7.5	Call Transfer-Add-on to Fully Restricted Station		C	
2.1.7.6	Call Transfer Attendant		C	
2.1.7.7	Call Hold		C	
2.1.7.8	Conference Calling - Six Way Station Controlled		C	
2.1.8.1	Call Forwarding Variable		C	
2.1.8.2	Call Forwarding Busy Line (CFBL)		C	
2.1.8.3	Call Forwarding Don't Answer All Calls		C	
2.1.8.4	CLASS Feature: Selective Call Forwarding		C	
2.1.9.1	Call Pick-Up		C	
2.1.9.2	Directed Call Pick-Up		C	
2.1.9.3	Directed Call Pick-Up without Barge-In		C	
2.2.1	Precedence and Preemption		C	
2.2.2	Call Display		C	
2.2.3	Class of Service Override		C	
2.2.4	Busy Override and Busy Verification		C	
2.2.5	Night Service		C	
2.2.6	Automatic Recall of Attendant		C	
2.2.7	Calls in Queue to the Attendant		C	
2.3.1	PBX Line		C	
2.3.2	Direct Inward Dialing (DID)		C	
2.3.3	National ISDN 1/2 Basic Access		R	C
2.3.4	National ISDN 1/2 Primary Access.		R	C
2.3.5	Analog Line		R	C
2.4.1	Basic Emergency Service (911)		C	C

PARAGRAPH	SUBJECT			
			PBX1	PBX2
2.4.2	Tracing of Terminating Calls.		R	
2.4.3	Outgoing Call Tracing.		R	
2.5.1.5	Synchronous Test Line		C	
2.5.4.1	Manual Test of Line		C	
2.5.5	Trunk Group - Remove from Service (Make Busy)		R	
2.5.6	Trunk Group - Restore to Service (Make Idle)		R	
2.6	Preset Conferencing		C	
2.6.1	Conference Notification Recorded Announcement		C	
2.6.2	Automatic Retrial and Alternate Address		C	
2.6.3	Bridge Release		C	
2.6.4	Secondary Conferencing		C	
2.7	Address Translation		C	
2.8	Nailed-Up Connections		C	
2.9	Assured Dial Tone		C	
	SECTION 3 - Multi-Level Precedence and Preemption (MLPP)			
3.1.1	Description		R	
3.1.2	Precedence Levels		R	
3.1.3	Announcements		R	
3.1.4	Invocation and Operation.		R	
3.2	Preemption in the Network		R	
3.2.1	Network Facilities Active With Lower Precedence Calls		R	
3.2.2	Network Facilities Active With Equal or Higher Precedence Call		R	
3.2.3	MLPP Trunk Selection (Hunting).		R	
3.2.3.1	Hunt Sequence for Trunks		R	
3.2.3.1.1	ROUTINE Calls		R	
3.2.3.1.2	Precedence Calls Above ROUTINE		R	
3.2.3.1.2.1	Method 1		R	
3.2.4.1	Calls From non-MLPP Networks		R	
3.2.4.2	Precedence Calls to Non-MLPP Networks		R	
3.3	Precedence Call Diversion		C	
3.4.1	Channel Associated Signaling (CAS)		C	
3.4.2	Primary Rate Interface (PRI)		R	
3.5.1	Busy At The Called Party's Interface		R	
3.5.1.1	Line Active With A Lower Precedence Call		R	
3.5.1.2	Line Active With An Equal or Higher Precedence Call Above Routine		R	
3.6	ISDN Basic Rate Interface (BRI)		R	

PARAGRAPH	SUBJECT			
			PBX1	PBX2
3.6.2	Single B-Channel, Single Appearance, Single Directory Number (DN)		R	
3.6.2.1	Line Active With A Lower Precedence Call		R	
3.6.2.2	Line Active With An Equal or Higher Precedence Call		R	
3.6.3	Single B-Channel, Multiple Appearances, Single Directory Number (DN)		R	
3.6.4	Two (2) B-Channels, Multiple Appearances, Single Directory Number (DN)		R	
3.6.5	Two B-Channels, 2 Directory Numbers (DN)		R	
3.7.2	Precedence Level Information Elements		R	
3.7.3	Disconnect Message Information Cause Values		R	
3.7.4	Signal Information Element		R	
3.7.5	ANSI T1.619a Setup Message Called Party Number Format		R	
3.7.6	ANSI T1.619a and non-T1.619a Interaction		R	
3.8.1	Precedence Call Waiting		C	
3.8.1.1	Busy with higher precedence call		C	
3.8.1.2	Busy with equal precedence call		C	
3.8.1.3	Busy with lower precedence call		C	
3.8.1.4	No Answer		C	
3.8.2	Call Forwarding		C	
3.8.2.1	Call Forwarding at a Busy Station		C	
3.8.2.2	Call Forwarding - No Reply at Called Station		C	
3.8.3.1	Call transfer interaction at different precedence levels		C	
3.8.3.2	Call transfer interaction at same precedence levels		C	
3.8.4	Call Hold		C	
3.8.5	Three-Way Calling (TWC)		C	
3.8.6	Call Pick-Up		C	
3.8.7.1	Conference Precedence Level		C	
3.8.8	Multiline Hunt Service		C	
3.8.9	Community of Interest (COI)		C	
3.8.9.2.1	COI Screening treatment for Originating Call Requests		C	
3.8.9.2.2	COI Screening treatment for Terminating Call Requests		C	
3.11.1	Electronic Key Telephone Systems (EKTS)		C	
3.11.1.1	Call Appearances		C	
3.11.1.2	Hold		C	
3.11.1.3	DN Bridging		C	

PARAGRAPH	SUBJECT			
			PBX1	PBX2
3.11.1.4	Intercom Calling		C	
3.11.1.5	Abbreviated Or Delayed Ringing Treatment On Incoming Calls		C	
3.11.1.6	Bridged Call Exclusion (BCE)		C	
3.11.1.7	Non-ISDN Users		C	
3.12.1	Precedence Parameter		C	
3.12.2	Cause Values & Location Codes		C	
	SECTION 4 - Call Processing			
4.1.1	Origination Treatment		R	R
4.1.1.1	Originating Busy		R	R
4.1.2	Termination Treatment		R	R
4.1.2.1	Busy or Idle Status		R	R
4.1.3	Release Treatment		R	R
4.1.4	Interruption Treatment		R	R
4.1.5	Connections		R	R
4.1.6	Class of Service		C	C
4.3.1	Ear & Mouth (E&M) Lead Signaling States		C	C
4.3.2	Four-Wire Analog User Access Lines		C	C
4.3.3	Two-Wire User Access Lines		R	R
4.3.4.1	Busy/Idle Status		R	
4.5.1.1	DSN User Dialing.		R	
4.5.1.2	Interswitch and Intraswitch Dialing.		C	
4.5.1.2.1	Seven-Digit Dialing		C	
4.5.1.2.2	Ten-Digit Dialing		C	
4.5.1.3	Access Code		R	
4.5.1.3.1	Access Digit		R	
4.5.1.3.2	Precedence Digit		R	
4.5.1.3.3	Service Digits		R	
4.5.1.4	Route Code		R	
4.5.1.5	Area Code		R	
4.5.1.6	Switch Code		R	
4.5.1.7	Line Number		R	
4.5.1.8	Emergency Service 911 Conflict Resolution		R	
Table 4-9	DSN Switch MFR1 Outpulsing Digit Format		C	
Table 4-10	DSN Switch DTMF Outpulsing Digit Format		C	
4.5.3	Standard Directory Numbers		R	
4.5.4	Standard Test Numbers		C	
4.5.5	Base Services - Abbreviated Numbers		C	
4.5.6	Digit Reception Requirements		R	
4.5.8	Screening		C	C
4.5.8.1	Zone Restriction Servicing of Local		C	C

PARAGRAPH	SUBJECT			
			PBX1	PBX2
	Originators			
	SECTION 5 - Signaling			
5.2.1	Loop Start Line		C	C
5.2.1	Ground Start Line		C	C
5.3.1	Reverse Battery (RB)		R	R
5.3.2	Immediate Start		C	C
5.3.3.1	Normal Wink Start Operation		C	C
5.3.3.2	Glare Operation		C	C
5.3.3.3.1	Wink Start		C	C
5.3.3.3.2	Glare Resolution		C	C
5.3.4	Delay Dial		C	C
5.3.5	Call for Service Timing		C	C
5.3.6	Guard Timing		C	C
5.3.7	Satellite Interface		C	C
5.3.8	Disconnect Control		C	C
5.3.9	Reselect or Retrial		C	C
5.3.10	Off-Hook Supervision Transitions (Unexpected Stop)		C	C
5.4.1	Dial-Pulse (DP) Signals		C	C
5.4.2	Dual Tone Multi-Frequency (DTMF) Signaling		C	C
5.4.2.1	Standard Digit Format for Precedence		C	
5.4.3	MF (R1) 2/6 Signaling		C	
5.5.1	Ringing		R	
5.5.2	DSN Information Signals		R	
5.7.1.1	Application		R	
5.7.1.2	Physical Layer.		R	
5.7.1.2.1	S/T Reference Point		R	
5.7.1.3	Data-Link Layer.		R	
5.7.1.3.1	Data-Link Connections		R	
5.7.1.3.2	Peer-to-Peer Procedures of the Data-Link Layer		R	
5.7.1.4	Layer 3 DSN User-to-Network Signaling		R	
5.7.1.4.2	DSN User-to-Network Signaling for Circuit-Switched (CS) Bearer Service		R	
5.7.1.4.3	Sequence of Messages for DSN Circuit-Switched (CS) Calls		R	
5.7.1.4.4	Message Functional Definitions and Content		R	
5.7.1.4.5	General Message Format and Info. Elements (IE) Coding		R	
5.7.1.4.6	Supplementary Services		C	C
	SECTION 6 - Transmission			

PARAGRAPH	SUBJECT			
			PBX1	PBX2
6.0	DISN/DSN Transmission Interface		R	R
6.1	Input Impedance		R	R
6.2	Inserted Connection Loss		R	R
6.2.1	Average Loss At 1004 Hz And Loss Control		R	R
6.2.2	Loss Variability At 1004 Hz		R	R
6.2.3	Attenuation Distortion		R	R
6.2.4	Tracking Error		R	R
6.3	Frequency Response		R	R
6.4	Overload Level		R	R
6.5	Return Loss		R	R
6.5.1	Two-Wire Line Return Loss		R	R
6.5.2	Four-Wire Trunk Return Loss (Impedance)		R	R
6.6	Longitudinal Balance		R	R
6.7	60 Hz Longitudinal Current		R	R
6.8	Idle Channel Noise		R	R
6.8.1	C-Message Weighting		R	R
6.8.2	Flat-Weighting Noise		R	R
6.9	Power Line Interference		R	R
6.10	Impulse Noise		R	R
6.11	Crosstalk Coupling		R	R
6.12	Intermodulation Distortion		R	R
6.13	Signal To Distortion Ratio (C-Notched Noise)		R	R
6.14	Absolute Delay		R	R
6.15	Envelope Delay Distortion		R	R
6.15.1	Echo Path Delay		R	R
6.16	Bit Integrity		R	R
6.17	Switched Digital Bit Error Rate		R	R
6.18	Encoding And Decoding Levels		R	R
6.18.1	DSN Fixed Loss Plan		R	R
6.18.1.1	Switch Transmission Level Points (TLPs).		R	R
	SECTION 7 - System Interfaces			
7.1	PCM-24 Digital Trunk Interface		R	R
7.1.1	Interface Characteristics		R	R
7.1.2	Supervisory Channel Associated Signaling		C	C
7.1.3	Clear Channel Capability (CCC)		C	C
7.1.4	Alarm and Restoral Requirements		C	C
7.2	PCM-30 Digital Trunk Interface		C	C
7.2.1	Supervisory Channel Associated Signaling		C	C
7.2.2	Alarm and Restoral Requirements		C	C
7.3	Interoperation of PCM-24 and PCM-30		C	C

PARAGRAPH	SUBJECT			
			PBX1	PBX2
	Systems			
7.4	Analog Trunk Interface		C	C
7.4.1	E&M Trunk Circuits		C	C
7.4.2	Single Frequency (SF) Trunk Circuits		C	C
7.4.3	Dual Frequency (DF) Trunk Circuits		C	C
	SECTION 10 - Integrated Services Digital Network (ISDN) Generic Requirements	**Refer to Section 10 for compliance**		
	SECTION 11 - Synchronization			
11.1.1.2	Line Timing Mode		R	C
11.1.2.2	Stratum 4 Clock		C	C
11.2	Synchronization Performance Monitoring Criteria		C	C
11.3	DS1		C	C
11.4	DS0 Traffic Interconnects		C	C
	Section 12 - Reliability		R**	C
	Section 13 - Security		R	

LEGEND:

PBX2 - Private Branch Exchange 2

PBX1 - Private Branch Exchange 1 R - Required / C - Conditional

R** - Section 12 of DRAFT is modified to state:

[Required: PBX1] The DSN shall meet reliability requirements in Sections 4 thru 10 of GR-512-CORE, Reliability, Section 12, Issue 2, January 1998.